Amendments to the Claims:

The following Listing of the Claims replaces all prior versions and listings of the claims in this application.

Listing of the Claims:

1. (Currently Amended): A method of designing a multifocal ophthalmic lens with one base focus and at least one additional focus, capable of reducing aberrations of the eye for at least one of the foci after its implantation, comprising the steps of:

   (i) characterizing at least one corneal surface as a mathematical model;

   (ii) calculating the resulting aberrations of said corneal surface(s) by employing said mathematical model; and

   (iii) modelling the multifocal ophthalmic lens such that a wavefront arriving from an optical system comprising said lens and said at least one corneal surface obtains reduced aberrations for at least one of the foci.

2. (Original): A method according to claim 1, wherein the ophthalmic lens is a multifocal intraocular lens.

3. (Currently Amended): A method according to claim 1 ~~or 2~~, comprising determining the resulting aberrations of said corneal surface(s) in terms of a wavefront having passed said cornea.

4. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 3~~, wherein said corneal surface(s) is(are) characterized in terms of a conoid of rotation.

5. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 3~~ wherein said corneal surface(s) is(are) characterized in terms of polynomials.

6. (Original): A method according to claim 5, wherein said corneal surface(s) is(are) characterized in terms of a linear combination of polynomials.

7. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, wherein said optical system further comprises complementary means for optical correction, such as spectacles or an ophthalmic correction lens.

8. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, wherein estimations of corneal refractive power and axial eye length designate the selection of the optical powers for the multifocal intraocular lens.

9. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, wherein the multifocal intraocular lens is modelled by selecting a suitable aspheric component for the anterior surface.

10. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, including characterizing the front corneal surface of an individual by means of topographical measurements and expressing the corneal aberrations as a combination of polynomials.

11. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, including characterizing front and rear corneal surfaces of an individual by means of topographical measurements and expressing the total corneal aberrations as a combination of polynomials.

12. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, including characterizing corneal surfaces of a selected population and expressing average corneal aberrations of said population as a combination of polynomials.

13. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, comprising the further steps of :

~~(vii)~~ calculating the aberrations resulting from an optical system comprising said

modelled intraocular lens and cornea; and

~~(iix)~~ determining if the modelled intraocular lens has provided sufficient reduction in aberrations; and optionally re-modelling the intraocular lens until a sufficient reduction is obtained.

14. (Original): A method according to claim 13, wherein said aberrations are expressed as a linear combination of polynomials.

15. (Currently Amended): A method according to claim 13 ~~or 14~~, wherein the re-modelling includes modifying one or several of the anterior surface shape and central radius, the posterior surface shape and central radius, lens thickness and refractive index of the lens.

16. (Currently Amended): A method according to claim 14 ~~any of the claims 14 to 15~~, wherein the re-modelling includes modifying the anterior surface of the lens.

17. (Currently Amended): A method according to claim 14 ~~any of the claims 14 to 16~~, wherein said polynomials are Seidel or Zernike polynomials.

18. (Original): A method according to claim 17, comprising modelling a lens such that an optical system comprising said model of intraocular lens and cornea provides reduction of spherical terms as expressed in Seidel or Zernike polynomials in a wave front having passed through the system.

19. (Currently Amended): A method according to claim 17 ~~or 18~~, comprising the steps of:

expressing the corneal aberrations as a linear combination of Zernike polynomials;

determining the corneal wavefront Zernike coefficients;

modelling the multifocal intraocular lens such that an optical system comprising said model lens and cornea provides a wavefront having a sufficient reduction of Zernike

coefficients in at least 1 of the foci.

20. (Original): A method according to claim 19, further comprising the steps of :

calculating the Zernike coefficients of a wavefront resulting from an optical system comprising the modelled multifocal intraocular lens and cornea;

determining if said intraocular lens has provided a sufficient reduction of Zernike coefficients; and optionally re-modelling said lens until a sufficient reduction is said coefficients are obtained.

21. (Original): A method according to claim 20, comprising sufficiently reducing Zernike coefficients referring to spherical aberration.

22. (Currently Amended): A method according to <u>claim 19</u> ~~any of the claims 19 to 21~~ comprising sufficiently reducing Zernike coefficients referring to aberrations above the fourth order.

23. (Currently Amended): A method according to <u>claim 19</u> ~~any of the claims 19 to 22~~ comprising sufficiently reducing the 11th Zernike coefficient of a wavefront front from an optical system comprising cornea and said modelled intraocular lens, so as to obtain an eye sufficiently free from spherical aberration.

24. (Currently Amended): A method according to <u>claim 1</u> ~~any of the preceding claims~~, wherein the reduction of aberrations is optimized for one of the foci.

25. (Original): A method according to claim 24, wherein the reduction of aberrations is optimized for the base focus.

26. (Original): A method according to claim 24, wherein the reduction of aberrations is optimized for one of the at least one additional focus.

27. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 23~~, wherein the reduction of aberrations is optimized for the base focus and the at least one additional focus, simultaneously.

28. (Currently Amended): A method according to claim 1 ~~any of the preceding claims~~, wherein the modelling of the multifocal intraocular lens comprises modelling the lens as a multifocal lens of diffractive type.

29. (Original): A method according to claim 28, wherein the diffractive pattern is formed on the anterior and/or posterior surface of the lens.

30. (Original): A method according to claim 29, wherein the diffractive pattern is formed on the lens surface that is modelled to reduce aberrations of the optical system.

31. (Original): A method according to claim 29, wherein the diffractive pattern is formed on one surface of the lens and the other surface of the lens is modelled to reduce aberrations of the optical system.

32. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 28~~, wherein the modelling of the multifocal intraocular lens comprises modelling the lens as a multifocal lens of refractive type with annular rings with different radii of curvatures.

33. (Original): A method according to claim 32 wherein the annular rings are formed on the lens surface that is modelled to reduce aberrations of the optical system.

34. (Original): A method according to claim 32 wherein the annular rings are formed on one surface of the lens and the other surface is modelled to reduce aberrations of the optical system.

35. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 34~~, wherein the modelling of the multifocal intraocular lens comprises modelling a

bifocal lens.

36. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 35~~, wherein the modeling of the multifocal intraocular lens provides a lens with substantially the same reduced aberrations for all foci.

37. (Currently Amended): A method according to claim 1 ~~any of the claims 1 to 36~~, wherein the sum of the modulation for the two or more foci is more than 0.40, at a spatial frequency of 50 cycles per millimetre, when the measurements are performed in an average/individual eye model using a 5mm aperture.

38. (Original): A method according to claim 37, wherein the sum of the modulation for the two or more foci is more than 0.50.

39. (Currently Amended): A method according to claim 37 ~~or 38~~, wherein the modelling of the multifocal intraocular lens comprises modelling a bifocal lens with a light distribution of 50-50% between the two foci, and the modulation is at least 0.2 for each focus.

40. (Currently Amended): A method of selecting a multifocal intraocular lens that is capable of reducing aberrations of the eye for at least one of the foci after its implantation comprising the steps of:

(i) characterizing at least one corneal surface as a mathematical model;

(ii) calculating the resulting aberrations of said corneal surfaces(s) by employing said mathematical model;

(iii) selecting an intraocular lens having a suitable configuration of optical powers from a plurality of lenses having the same power configurations, but different aberrations; and

(iv) determining if an optical system comprising said selected lens and corneal model

sufficiently reduces the aberrations.

41. (Original): A method according to claim 40, comprising determining the resulting aberrations of said corneal surface(s) in a wavefront having passed said cornea.

42. (Currently Amended): A method according to claim 40 ~~or 41~~ further comprising the steps of:

(v) calculating the aberrations of a wave front arriving from an optical system of said selected lens and corneal model;

(vi) determining if said selected multifocal intraocular lens has provided a sufficient reduction in aberrations in a wavefront arriving from said optical system for at least one of the foci; and

optionally repeating steps (iii) and (iv) by selecting at least one new lens having the same optical power until finding a lens capable of sufficiently reducing the aberrations.

43. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 42~~, wherein said corneal surface(s) is(are) characterized in terms of a conoid of rotation.

44. (Currently Amended): A method according to claim 40, ~~any of the claims 40 to 42~~ wherein said corneal surface(s) is(are) characterized in terms of polynomials.

45. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 42~~, wherein said corneal surface(s) is(are) characterized in terms of a linear combination of polynomials.

46. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 45~~, wherein said optical system further comprises complementary means for optical correction, such as spectacles or an ophthalmic correction lens.

47. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 46~~, wherein corneal refractive power and axial eye length estimations designate the selection of lens optical powers for the multifocal intraocular lens..

48. (Currently Amended): A method according to claim 39 ~~or 45~~, wherein an optical system comprising said corneal model and selected multifocal intraocular lens provides for a wavefront substantially reduced from aberrations for at least one of the foci, as expressed by at least one of said polynomials.

49. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 48~~ including characterizing the front corneal surface of an individual by means of topographical measurements and expressing the corneal aberrations as a combination of polynomials.

50. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 49~~ including characterizing front and rear corneal surfaces of an individual by means of topographical measurements and expressing the total corneal aberrations as a combination of polynomials.

51. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 46~~, including characterizing corneal surfaces of a selected population and expressing average corneal aberrations of said population as a combination of polynomials.

52. (Currently Amended): A method according to claim 45 ~~or 51~~, wherein said polynomials are Seidel or Zernike polynomials.

53. (Original): A method according to claim 52, comprising the steps of:

(i) expressing the corneal aberrations as a linear combination of Zernike polynomials;
(ii) determining the corneal Zernike coefficients;
(iii) selecting the multifocal intraocular lens such that an optical system comprising said lens and cornea provides a wavefront having a sufficient reduction in Zernike

coefficients for at least one of the foci.

54. (Original): A method according to claim 53, further comprising the steps of :

(iv) calculating the Zernike coefficients resulting from an optical system comprising the modelled multifocal intraocular lens and cornea;
(v) determining if said intraocular lens has provided a reduction of Zernike coefficients; and optionally selecting a new lens until a sufficient reduction is said coefficients is obtained.

55. (Currently Amended): A method according to claim 53 ~~or 54~~, comprising determining Zernike polynomials up to the 4^{th} order.

56. (Currently Amended): A method according to <u>claim 53</u> ~~any of the claims 53 to 55~~ comprising sufficiently reducing Zernike coefficients referring to spherical aberration.

57. (Currently Amended): A method according to <u>claim 53</u> ~~any of the claims 53 to 56~~ comprising sufficiently reducing Zernike coefficients above the fourth order.

58. (Currently Amended): A method according to <u>claim 53</u> ~~any of the claims 53 to 57~~ comprising sufficiently reducing the 11th Zernike coefficient of a wavefront front from an optical system comprising model cornea and said selected intraocular lens, so as to obtain an eye sufficiently free from spherical aberration for at least one of the foci.

59. (Currently Amended): A method according to <u>claim 53</u> ~~any of the claims 53 to 58~~ comprising selecting a intraocular lens such that an optical system comprising said intraocular lens and cornea provides reduction of spherical aberration terms as expressed in Seidel or Zernike polynomials in a wave front having passed through the system.

60. (Currently Amended): A method according to claim 53 ~~any of the claims 53 to 59~~, wherein reduction in higher aberration terms is accomplished.

61. (Currently Amended): A method according to claim 40, ~~any of the claims 40 to 60~~ characterized by selecting a multifocal intraocular lens from a kit comprising lenses with a suitable range of power configurations and within each range of power configurations a plurality of lenses having different aberrations.

62. (Original): A method according to claim 61, wherein said aberrations are spherical aberrations.

63. (Original): A method according to claim 62, wherein said lenses within each range of power configurations have surfaces with different aspheric components.

64. (Original): A method according to claim 63, wherein said surfaces are the anterior surfaces.

65. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 64~~, wherein the reduction of aberrations is optimized for one of the foci.

66. (Original): A method according to claim 65, wherein the reduction of aberrations is optimized for the base focus.

67. (Original): A method according to claim 65, wherein the reduction of aberrations is optimized for one of the at least one additional focus.

68. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 64~~, wherein the reduction of aberrations is optimized for the base focus and the at least one additional focus, simultaneously.

69. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 68~~, wherein the multifocal intraocular lens is a multifocal lens of diffractive type.

70. (Original): A method according to claim 69, wherein the diffractive pattern is formed on the anterior and/or posterior surface of the lens.

71. (Original): A method according to claim 70, wherein the diffractive pattern is formed on the lens surface that is modelled to reduce aberrations of the optical system.

72. (Original): A method according to claim 70, wherein the diffractive pattern is formed on one surface of the lens and the other surface of the lens is modelled to reduce aberrations of the optical system.

73. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 68~~, wherein the multifocal intraocular lens is a multifocal lens of refractive type with annular rings with different radii of curvatures.

74. (Original): A method according to claim 73 wherein the annular rings are formed on the lens surface that is modelled to reduce aberrations of the optical system.

75. (Original): A method according to claim 73 wherein the annular rings are formed on one surface of the lens and the other surface is modelled to reduce aberrations of the optical system.

76. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 75~~, wherein the multifocal intraocular lens is a bifocal lens.

77. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 35~~, wherein the multifocal intraocular lens has substantially the same reduced aberrations for all foci.

78. (Currently Amended): A method according to claim 40 ~~any of the claims 40 to 77~~, wherein the sum of the modulation for the two or more foci is more than 0.40, at a spatial frequency of 50 cycles per millimetre, when the measurements are performed in an average/individual eye model using a 5mm aperture.

79. (Original): A method according to claim 78, wherein the sum of the modulation for the two or more foci is more than 0.50.

80. (Currently Amended): A method according to claim 78 ~~or 79~~, wherein the lens is bifocal with a light distribution of 50-50% between the two foci and the modulation is at least 0.2 for each focus.

81. (Currently Amended): A method of designing a multifocal ophthalmic lens suitable for implantation into the eye, comprising ~~characterized by~~ the steps of:

selecting a representative group of patients;

collecting corneal topographic data for each subject in the group;

transferring said data to terms representing the corneal surface shape of each subject for a preset aperture size;

calculating a mean value of at least one corneal surface shape term of said group, so as to obtain at least one mean corneal surface shape term and/or calculating a mean value of at least one to the cornea corresponding corneal wavefront aberration term, each corneal wavefront aberration term being obtained by transforming corresponding through corneal surface shape terms; and

from said at least one mean corneal surface shape term or from said at least one mean corneal wavefront aberration term designing a multifocal ophthalmic lens capable of reducing said at least one mean wavefront aberration term of the optical system comprising cornea and lens for at least one of the foci.

82. (Currently Amended): Method according to claim 81, ~~characterized in that it~~ further comprising ~~comprises~~ the steps of:

designing an average corneal model for the group of people from the calculated at least one mean corneal surface shape term or from the at least one mean corneal

wavefront aberration term; and

checking that the designed multifocal ophthalmic lens compensates correctly for the at least one mean aberration term for at least one of the foci by measuring these specific aberration terms of a wavefront having travelled through the model average cornea and the lens and redesigning the multifocal lens if said at least one aberration term not has been sufficiently reduced in the measured wavefront.

83. (Currently Amended): Method according to claim 81, comprising ~~or 82, characterized by~~ calculating an aspheric surface descriptive constant for the lens to be designed from the mean corneal surface shape terms or from the mean corneal wavefront aberration terms for a predetermined radius.

84. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-83, characterized by~~ selecting people in a specific age interval to constitute the group of people.

85. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-84, characterized by~~ selecting people who will undergo a cataract surgery to constitute the group of people.

86. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-85, characterized by~~ designing the lens specifically for a patient that has undergone corneal surgery and therefore selecting people who have undergone corneal surgery to constitute the group of people.

87. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-86, characterized by~~ selecting people who have a specific ocular disease to constitute the group of people.

88. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-87, characterized by~~ selecting people who have a specific ocular optical

defect to constitute the group of people.

89. (Currently Amended): Method according to claim 81, ~~any one of the claims 81-88, characterized in that it~~ further comprising ~~comprises~~ the steps of:

measuring the at least one wavefront aberration term of one specific patient's cornea; and

determining if the selected group corresponding to this patient is representative for this specific patient and, if this is the case, implanting ~~implant~~ the multifocal lens designed from these average values and, if this ~~not~~ is not the case, implanting ~~implant~~ a multifocal lens designed from average values from another group or designing ~~design~~ an individual lens for this patient.

90. (Currently Amended): Method according to claim 89, comprising ~~any one of the claims 81-89, characterized by~~ providing the multifocal lens with at least one nonspherical surface that reduces at least one positive aberration term of an incoming nonspherical wavefront for at least one of the foci.

91. (Currently Amended): Method according to claim 90, wherein ~~characterized in that~~ said positive aberration term is a positive spherical aberration term.

92. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-91, characterized by~~ providing the multifocal lens with at least one nonspherical surface that reduces at least one term of a Zernike polynomial representing the aberration of an incoming nonspherical wavefront for at least one of the foci.

93. (Currently Amended): Method according to claim 92, comprising ~~characterized by~~ providing the lens with at least one nonspherical surface that reduces the 11th normalized Zernike term representing the spherical aberration of an incoming nonspherical wavefront.

94. (Currently Amended): A method according to claim 81, comprising ~~any of claims 81-93 characterized by~~ designing a multifocal lens to reduce, for at least one of the foci, spherical aberration in a wavefront arriving from an average corneal surface having the formula:

$$z = \frac{(1/R)r^2}{1+\sqrt{1-(\frac{1}{R})^2(\mathbf{cc}+1)r^2}} + \mathbf{ad}r^4 + \mathbf{ae}r^6$$

wherein the conical constant cc has a value ranging between –1 and 0, R is the central corneal radius and ad and ae are aspheric constants.

95. (Original): A method according to claim 94, wherein the conical constant (cc) ranges from about –0.05 for an aperture size (pupillary diameter) of 4 mm to about –0.18 for an aperture size of 7 mm.

96. (Currently Amended): Method according to claim 81, comprising ~~-95, characterized by~~ providing the multifocal lens with a surface described by a conoid of rotation modified conoid having a conical constant (cc) less than 0.

97. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-96, characterized by~~ providing the multifocal lens with a, for the patient, suitable power configuration~~,~~.

98. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-97, characterized by~~ designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000698 mm to 0.000871 mm for a 3 mm aperture radius.

99. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-97, characterized by~~ designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value

in the interval from 0.0000161 mm to 0.000200 mm for a 2 mm aperture radius.

100. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-97, characterized by~~ designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000465 mm to 0.000419 mm for a ~~2,5~~ 2.5 mm aperture radius.

101. (Currently Amended): Method according to claim 81, comprising ~~any one of the claims 81-97, characterized by~~ designing the multifocal lens to balance, for at least one of the foci, the spherical aberration of a cornea that has a Zernike polynomial coefficient representing spherical aberration of the wavefront aberration with a value in the interval from 0.0000868 mm to 0.00163 mm for a ~~3,5~~ 3.5 mm aperture radius.

102. (Currently Amended): A multifocal ophthalmic lens obtained in accordance with claim 1 ~~any of the preceding claims~~, capable of, for at least one of its foci, transferring a wavefront having passed through the cornea of the eye into a substantially spherical wavefront having its centre in the retina of the eye.

103. (Currently Amended): A multifocal ophthalmic lens with one base focus and at least one additional focus, wherein ~~characterized in that~~ the shape of the lens is modelled such that the resulting aberrations are reduced for at least one of the foci in an optical system comprising said multifocal lens and a model cornea having aberration terms, or being without aberration terms.

Claims 104-174 (Cancelled).

175 (New): A multifocal ophthalmic lens obtained in accordance with claim 40, capable of, for at least one of its foci, transferring a wavefront having passed through the cornea of the eye into a substantially spherical wavefront having its centre in the retina of the eye.

176 (New): A multifocal ophthalmic lens obtained in accordance with claim 81, capable of, for at least one of its foci, transferring a wavefront having passed through the cornea of the eye into a substantially spherical wavefront having its centre in the retina of the eye.